ON LIFE FORMS IN MILLIPEDES (DIPLOPODA)

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О ЖИЗНЕННЫХ ФОРМАХ У ДВУПАРНОНОГИХ МНОГОНОЖЕК (DIPLOPODA)

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Unlike many other large animal groups of a wide ecological range, millipedes (Diplopoda) inhabit a narrower adaptive zone and morphologically are relatively uniform. Habitually even millipede orders are sometimes barely distinguishable, let alone lower taxa. Diplopods are quite widespread in the majority of landscapes and zones except for subarctic and desert.

Diplopoda constitute the largest myriapod class comprising hundreds of families and genera and many throusands of species, the bulk of which is restricted to the tropics and subtropics (Hoffman,1979). These animals chiefly inhabit forest litter and the uppermost soil strata, but also frequently occur under the bark and in the rotten wood of dead bushes and trees, on living bushes and trees, in/on moss, lichen and herb tussocks and epiphytes, under stones and other ground debris, deeper in the soil, in caves and grottos, nests of birds, ants, termites, in earthworm and other animal burrows and holes, in compost, etc. The majority of millipedes are phytosaprophages feeding on plant remains, and only a minor part of the class are micro-, mico-, zoo- and/or facultative phyto-, copro- and necrophages (Striganova, 1980).

The following general morphotypes can be outlined within the Diplopoda:

1. Polyxenoid. This type is represented exclusively by the order Polyxenida, the small and rather swiftly moving creatures unable of rolling into a spiral or sphere and possessing soft teguments, peculiar tufts of hollow setae, etc.

2. Glomeroid. This type includes the so-called 'pill-millipedes', i.e. forms of a more or less oniscomorph habitus capable of rolling up into a compact sphere (Glomerida and Sphaerotheriida, Glomeridesmida and even certain Polydesmida).

3. Juloid. This morphotype unites the diplopods capable of spiralling, possessing an elongated worm-like cylindrical body. Several modifications of this type can be observed, e.g. the forms with the body not particularly

moniliform and thin, as well as devoid of differentiated crests on the metasomites (partly the orders Julida and Spirobolida, the majority of Spirostreptida, perhaps even Stemmiulida and Siphoniulida) compose a juloid s.str. subtype; the creatures particularly thin and moniliform and also devoid of crests on the somites (the Blaniuloidea, partly the Nemasomatoidea and Juloidea from the order yulida, certain Cambalida, e.g. Hypocambala) constitute a blaniuloid subtype; the juliforms usually provided with well-differentiated longitudinal crests on the metasomites fall into a glyphiuloid subtype (the majority of the orders Cambalida and Callipodida, perhaps also the 'trachystreptine' Spirostreptida, though their crest-like armament is transversal).

4. Polydesmoid. This morphotype unites the diplopods capable of rolling up into a spiral with good and prominent lateral and/or dorsal projections on the diplosegments. The majority of both Polydesmida and Chordeumida can be attributed herein.

5. Platydesmoid. This type includes the millipedes usually unable of of tight spiralling with flat flexible and short legs. Such orders as Polyzoniida, Platydesmida, Siphonophorida. Perhaps some Chordeumatida (e.g.,Heterochordeumatidae) and Polydesmida can also be referred to this group.

Following both Ljovuschkin (1974, 1975) and Sharova (1981), it seems best to regard a life-form as a set of the organisms inhabiting under the same ecological conditions and possessing a complex of similar morphophysiological characters arisen under the influence of similar factors of natural selection we treat a life-form as a certain morphoecotype.

A life-form of stratobionts can be distinguished in millipedes and it comprises the forms restricted to litter and the uppermost soil layers. It is certainly dominant in this animal group and delimited quite vaguely. Niche segregation is observed between habitually very similar millipede congeners. Thus, some of the Cylindroiulus species of the madeirae-group indigenous in Madeira are confined to the soil, others to soil/litter interface, litter, logs, to moss tussocks, etc.

There can be little doubt that stratobionts must be considered the main basic life-form for the entire class Diplopoda. All the other more or less distinguishable life-forms are only derivative.

A life-form of pedobionts, or geobionts, is rather poorly represented in diplopods. Usually only the juloid and polydesmoid morphotypes inhabit deeper soil layers. This involves in the former a considerable body elongation, leg shortening, often a certain depigmentation of teguments and eye reduction, while the latters respond by a miniaturization, which permits,penetration into a looser soil rich in microcaverns. Juloids, more rarely glomeroids and even platydesmoids, are capable of penetrating deeper and heavier soil layers.

A life-form of troglobionts implies, on the contrary, a drastic elongation of both appendages and antennae, sometimes even 'gigantism', as well as depigmentation of the teguments and blindness. Sometimes certain modifications of the mouthparts are observed (Enghoff, 1985). The juloid, glomeroid and polydesmoid morphotypes are characteristic of cave-dyellers.

The transition of stratobionts into overground strata seems hardly to

have led to new life-forms in diplopods. A life-form of underbark xylobionts may be delimited manifested either in miniature (polyxenoids, certain glomeroids, etc.) or flat-backed (poly-, platydesmoids forms).

Even some very small and inconspicuous advantages in body and/or leg anatomy for climbing (Manton, 1977; Enghoff, 1983) are sufficient for the groundplan stratobionts to become xylobionts and, in the humid tropics and subtropics, epiphytobionts. Since all the known millipede morphotypes at least partly comprise good climbers, many of them, particularly under humid conditions, occur on living bushes and trees.

Regardless of certain morphological and ecological diversity diplopods can be considered as a primary forest floor group, with only a small number of less important eco-morphological deviations from the initial type. Diplopods, are sensitive to lack of moisture and, hence, dwell under conditions significantly different from those of a forest floor.

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D i s c u s s i o n

Dolin V.G.: Насколько обосновано выделение Вами 7 морфотипов у Diplopoda? Ведь имеются переходы между Вашими "морфотипами". Не было бы вернее выделение 3 морфотипов и разделение дробное отнести к юлоидно-гломероидному типу?

Golovatch S.I.: Суть работы - не столько выделение морфотипов (их много, они во многом условны), что скорее дело вкуса, а возможность (скорее плохая возможность) выделения морфоэкотипов у диплопод. Повторяю, это сделать намного труднее, чем морфотипы.